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Standard Guide for Core Sampling Submerged, Unconsolidated Sediments¹

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1. Scope

1.1 This guide covers core-sampling terminology, advantages and disadvantages of different types of core samplers, core-distortions that may occur during sampling, techniques for detecting and minimizing core distortions, and methods for dissecting and preserving sediment cores.

1.2 In this guide, sampling procedures and equipment are divided into the following categories based on water depth: sampling in depths shallower than 0.5 m, sampling in depths between 0.5 m and 10 m, and sampling in depths exceeding 10 m. Each category is divided into two sections: equipment for collecting short cores and equipment for collecting long cores.

1.3 This guide emphasizes general principles. Only in a few instances are step-by-step instructions given. Because core sampling is a field-based operation, methods and equipment must usually be modified to suit local conditions. This modification process requires two essential ingredients: operator skill and judgment. Neither can be replaced by written rules.

1.4 Drawings of samplers are included to show sizes and proportions. These samplers are offered primarily as examples (or generic representations) of equipment that can be purchased commercially or built from plans in technical journals.

1.5 This guide is a brief summary of published scientific articles and engineering reports. These references are listed in this guide. These documents provide operational details that are not given in this guide but are nevertheless essential to the successful planning and completion of core sampling projects.

1.6 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* For specific hazard statements, see Note 1 and Note 2.

2. Referenced Documents

2.1 ASTM Standards:

D 420 Guide to Site Characterization for Engineering, Design, and Construction Purposes²

D 1129 Terminology Relating to Water³

D 1452 Practice for Soil Investigation and Sampling by Auger Borings²

D 1586 Test Method for Penetration Test and Split-Barrel Sampling of Soils²

D 1587 Practice for Thin-Walled Tube Geotechnical Sampling of Soils²

D 4220 Practice for Preserving and Transporting Soil Samples²

D 4410 Terminology for Fluvial Sediment³

3. Terminology

3.1 *Definitions*—For definitions of terms used in this guide, refer to Terminology D 1129 and Terminology D 4410.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *check valve*—a device (see Fig. 1)⁴ mounted atop an open-barrel core sampler. As the sampler moves down through water and sediment, the valve remains open to allow water to flow up through the barrel. When downward motion stops, the valve closes. During retrieval, the valve remains closed and creates suction that holds the core inside the barrel.

3.2.2 *piston sampler*—a core sampler (see Fig. 2) with a solid cylinder (piston) that seals against the inside walls of the core barrel. The piston remains fixed at the bed-surface elevation while the core barrel cuts down through the sediment.

3.2.3 *core*—a vertical column of sediment cut from a parent deposit.

3.2.4 *core catcher*—a device (see Fig. 3) that grips and supports the core while the sampler is being pulled from the sediment and hoisted to the water surface.

3.2.5 *core conveyor*—a device (see Fig. 4) for reducing friction between a core and the inside surface of a core barrel.

3.2.6 *core-barrel liner*—a rigid, thin-wall tube mounted inside the barrel of a core sampler. During the core-cutting process, sediment moves up inside the liner.

3.2.7 *core sampler*—an instrument for collecting cores.

3.2.8 *extrude*—The act of pushing a core from a core barrel or a core-barrel liner.

3.2.9 *open-barrel sampler*—in simplest form, a straight tube open at both ends. More elaborate open-barrel samplers have core catchers and check valves.

3.2.10 *trip release*—a mechanism (see Fig. 2 and Fig. 5(b))

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² *Annual Book of ASTM Standards*, Vol 04.08.

³ *Annual Book of ASTM Standards*, Vol 11.01.

⁴ The boldface numbers in parentheses refer to the list of references at the end of this guide.